

Name:

The Perfect Animal

Can you create an animal that has adapted to total urbanization? Combine the characteristics of five different animals who have survived the many problems that people have created. These traits should be the most cleverly developed for living in an urban environment. Remember, you cannot invent something that does not already exist in the animal world.

Draw a picture of the animal and name it. List the function of each body part and be prepared to defend your choices:

For example:

1. Legs of a frog to swim in over flooded sewers.
2. Wings of an eagle to soar above the air pollution.
3. Nose of a pig to root through garbage.



WATER USAGE

WATER WORDS

OBJECTIVE:

Students will be able to describe a variety of ways and reasons why water is important to people and wildlife.

HOW TO GET THERE:

Students brainstorm, make collages, and carry out family discussions on water usage and conservation.

MATERIALS:

Large pieces of paper, magazines, scissors, and glue

GO FOR IT!

1. Students discuss all purposes for water.
2. Working in teams, students cut out magazine pictures of water, looking especially for pictures that show how all living things need water.
3. Still in teams, students construct a large collage of overlapping water pictures on one large piece of paper. Display on bulletin board.
4. Final Discussion: Challenge students to think of all the ways they have used water during the day. Stress the importance of water.

ASSIGNMENT:

Duplicate the chart below on tagboard. Send it home to be posted for a few days and discussed by the family. Have students bring back a *list* from home of the ways they could conserve water if there was a shortage.

CAN YOU BELIEVE IT?

Taking a bath	30 gallons
Taking a shower	25-30 gallons
Filling a sink	1-2 gallons
Flushing a toilet	4-6 gallons
Washing clothes	30-50 gallons per load
Washing dishes	6 gallons per load
Washing a car	60 gallons
Watering a lawn	100-200 gallons per hour

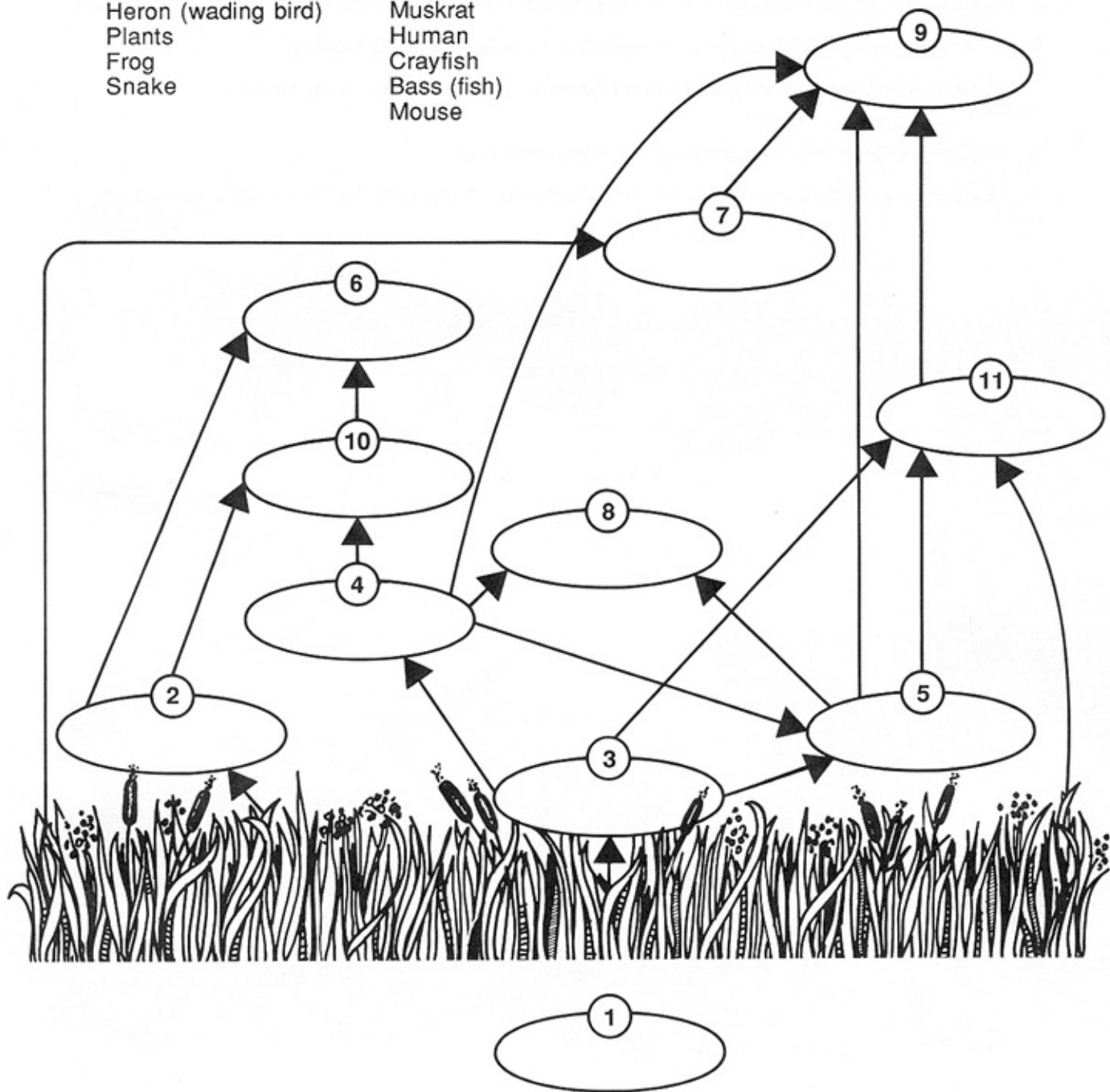
Freshwater Marsh Food Web Puzzle

Every creature has to eat. Some food comes from plants and some from animals. Most creatures eat many different things. Plants and animals, including humans, are all linked in a "food web".

Here is a simplified food web from a freshwater marsh area where pioneers might have settled 200 years ago. Read the clues and see if you can work out the web. Use the words below to fill in the correct numbered places. (Note: The arrows point away from the "food" toward the creature that eats it.)

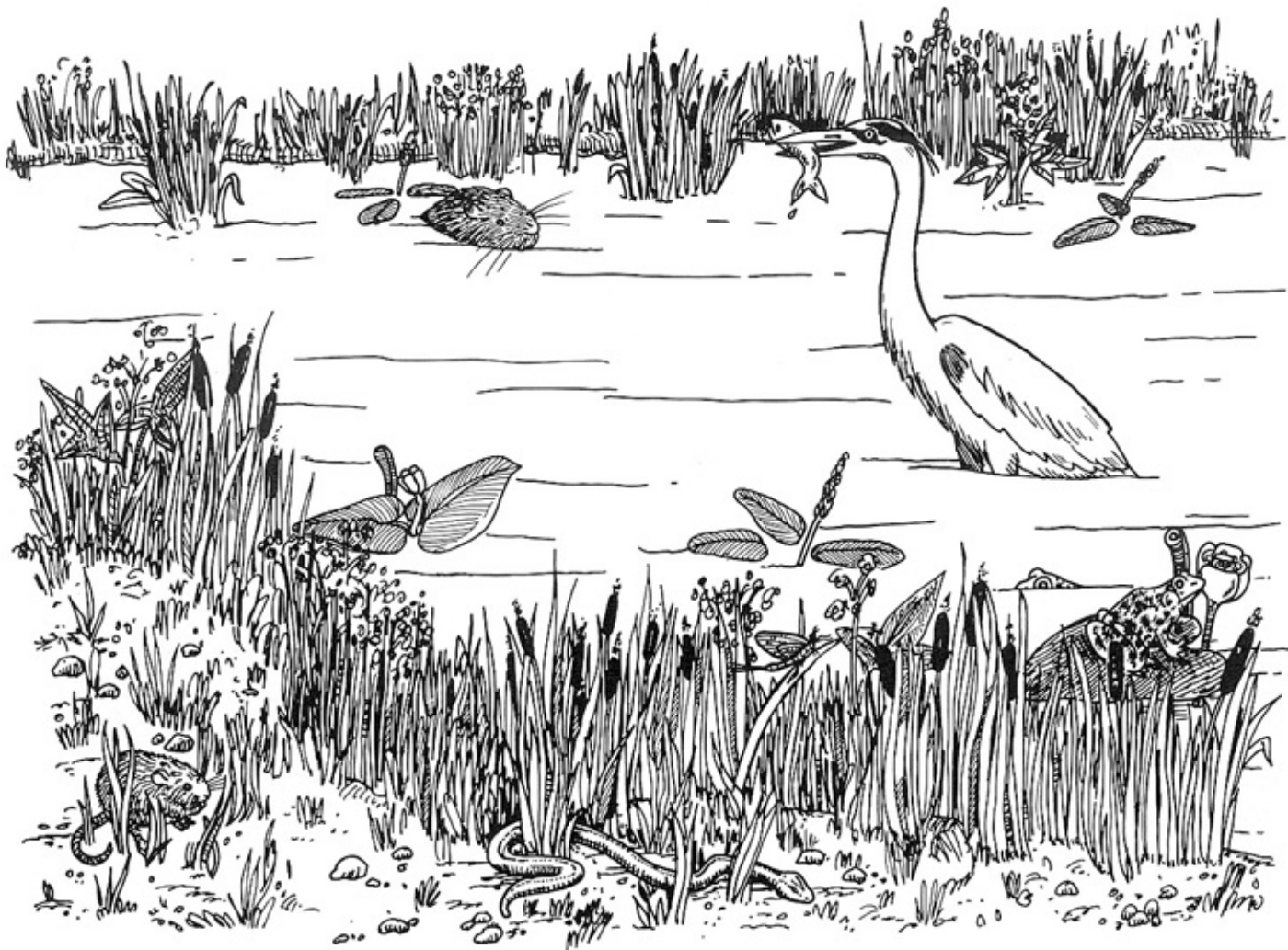
Mayfly
Heron (wading bird)
Plants
Frog
Snake

Owl
Muskrat
Human
Crayfish
Bass (fish)
Mouse



Clues

1. These living things use energy from the sun to make food. They provide the most food in the entire world.
2. This small marsh rodent eats plants and sometimes insects.
3. The larva of this flying insect feeds on plants.
4. This creature eats insects; it stays close to water but is sometimes found on land.
5. This animal lives all its life in the water and feeds on insects and frogs.
6. This bird hunts at night for snakes and mice.
7. This small mammal was hunted for its fur; its meat was also eaten. It eats mostly plants.
8. This long-legged bird wades among plants in shallow water, looking for fish and frogs.
9. This creature can find many things to eat in the marsh, including plants, fish, frogs, crayfish and muskrats.
10. This long reptile hunts for frogs and mice. It swallows prey whole.
11. This creature looks like a small lobster and swims backwards. It eats small dead fish, insect larvae and plants.



Answers: 1. plants, 2. mouse, 3. mayfly, 4. frog, 5. bass, 6. owl, 7. muskrat, 8. heron, 9. human, 10. snake, 11. crayfish.

Name _____

Migration Identification

When studying migratory birds, it is important to be able to identify them in flight. Here are the outlines of seven migratory birds from the Central Valley. Can you identify *any* of them? *Some* of them?

Answers below.



1. Northern Harrier Hawk
2. Northern Pintail
3. Northern Shoveler
4. Mallard
5. Canada Goose
6. Kingfisher
7. Sandhill Crane

Goose Mapping Project

Purpose

Through this activity, students will learn the migration route of a common migratory bird, the Canada goose. This will be done by compiling and mapping data from actual band reports.

Learning Outcomes

After completing this activity, students will be able to:

- A. Map the migration route of the Canada goose based on band reports.
- B. Define the terms wintering and breeding grounds.
- C. List two uses of band reports.
- D. List the four major flyways in North America.

Organization

Who: Groups of four
Where: Inside
When: Any time of year
Time: One to two hours

Materials for Class

- * Data Sheet - Band Results
- * Paper bag or hat

Materials for Each Student

- * Data Sheets - maps, flyways
- * Colored pencils or crayons
- * Quiz

Goose Mapping Project

Directions

1. The data sheet contains 50 banding results. Make five copies of these band reports. Cut data sheets into 250 strips and put these into a hat or paper bag. *Note:* These band reports are simplified versions of real data that have been turned in to the U.S. Fish and Wildlife Service.
2. Lead students in a discussion of bird banding. Banding is done to provide information regarding migratory birds' routes. Through recovery of birds' bands, data on direction and duration of migration is obtained. Introduce students to the idea of flyways, which are generalized migratory corridors. Although species' actual migrations do not strictly conform with these flyways, they are a useful way to indicate along which flyways birds migrate. (For instance, the Canada goose migrates along all four flyways.) (Refer them to their flyway maps.)
3. Hand out copies of the data sheet, mapping page and flyway sheet.
4. Tell students they are wildlife biologists compiling banding returns. Data are being sent to them regarding the locations of banded Canada geese. Their job is to map Canada goose migration - spring and fall - based on the reports. Tell students they will each receive data from seven or eight bands. While bands are recovered year round, the information students receive will be mainly from summer and fall migration periods. (Have the students suggest why more bands might be recovered at these times of the year.) Students can tell the difference by the dates: spring migrations generally occur between February and April, and fall migrations between September and December. Reports from January, May, June, July and August indicate nonmigrating times of the year. During the summer months geese are at their breeding grounds; during January they are wintering in more southern areas. Tell students they will plot reports on the maps they have been given. They should use different colors for migration dates and for dates indicating presence on wintering and breeding grounds.
5. Pass the hat with the strips of paper (banding results). Each student should have seven.

Have them mark the date of one banding result on the correct map location.

If someone has two identical results, both should be marked on the map.
6. Have students form groups of four to compare data. Students should map the banding report of the other group members. Based on the additional information, have students plot spring and fall migration routes based on the U.S. flyways and indicate generalized wintering and breeding grounds. Their data will indicate that the Canada geese used in this activity breed mostly in Canada. They migrate along either the Mississippi Flyway or the Atlantic Flyway. Therefore, the routes mapped can cover most of the states north of South Carolina and east of Wyoming.

Extended Activities:

7. If possible, make an enlargement of the data sheet map and plot all the band reports. Ask students where band report #1 was from and if the bird was recovered during the spring or fall migration. Plot each migration period in a different color. Continue collecting information from the class and plotting it until all reports have been shown.
8. Have students pick one of the flyways and research its geography. Generate a class list of possible problem areas and favorable habitats (refuges, rivers) which Canada geese might encounter on that route.

Through research and observation made throughout the school year, students can note the varying numbers, types, and varieties of birds in the area and determine which species migrate and which do not. They can then study one migratory species they have identified in the neighborhood and use a map and bird guides to examine where the species migrates. Research should include the route and timing of migration, obstacles encountered and traditional habitats used during migration.

If possible, have a local conservation officer or Fish and Wildlife Service employee bring in samples of actual bird bands and mounted birds with bands to discuss banding in greater detail. Have the speaker tell students what they should do if they see a band on a bird (either live or dead). Some wildlife refuges allow students to observe banding operations and, on occasion, will allow upper-level students to participate.

Quiz Answers:

1. The Canada geese depicted in this activity breed mostly in Canada and migrate along either the Mississippi or Atlantic Flyway.
2. a - Atlantic Flyway
b - Central Flyway
c - Pacific Flyway
d - Mississippi Flyway
3. True. While bands are found by many different individuals in different ways, the majority are sent in by hunters.
4. Wintering grounds - Argentina, South America
Breeding grounds - Alberta and Saskatchewan, Canada
5. Band reports give information regarding bird migration routes, wintering and breeding grounds, life expectancy, causes of death, etc.

Goose Mapping: QUIZ

1. Where do the Canada geese that you studied in this activity breed and what flyways do they use?
2. The map below shows the four major flyways of the United States. Based on the banding results below, which flyway would the migrating birds be using?
 - a. Birds banded in northern Quebec and recovered in Maine, Delaware, North Carolina, Rhode Island, and Maryland.
 - b. Birds banded in the Northwest Territories and recovered in Wyoming, New Mexico, Texas, and Montana.
 - c. Birds banded in Alaska and recovered in Oregon, Nevada, California, and Idaho.
 - d. Birds banded in Alaska and recovered in North Dakota, Great Lakes, Tennessee, Louisiana, and Missouri.
3. Wildlife biologists rely on information from bands returned by hunters to learn about migratory birds. True or False?
4. The Swainson's hawk breeds around the beginning of May. Based on the following banding results, where do you think this species winters? Where does it breed?

Bird One - Banded in Alberta, July 1977. Found dead in Kansas, August 20, 1978.
Bird Two - Banded in Saskatchewan, July 1974. Found dead in Argentina, March 4, 1976.
5. List two examples of information obtained from band reports:
 - a.
 - b.

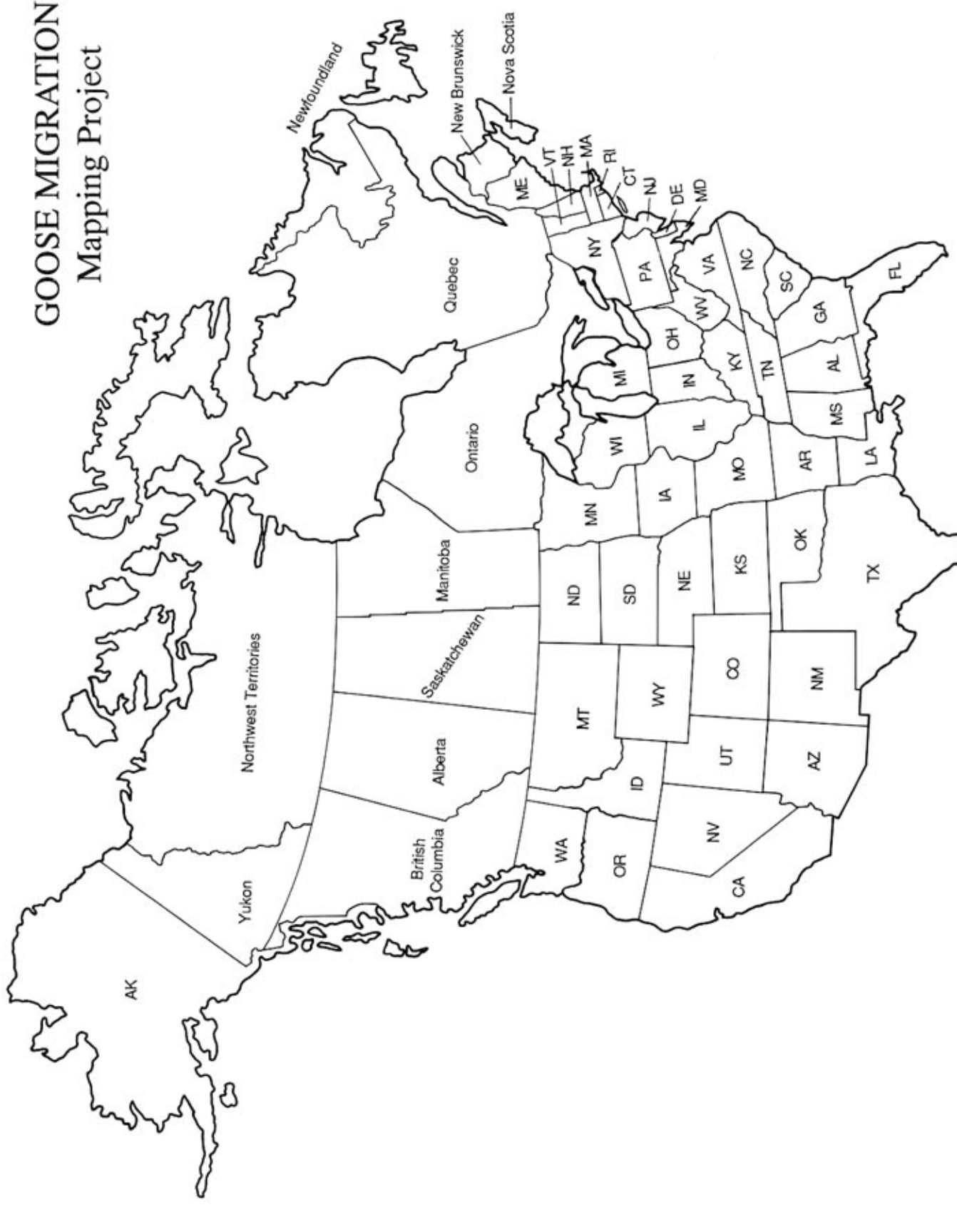
An outline map of the United States and Canada. The map shows the borders of all 50 US states and the 10 Canadian provinces and 3 territories. The names of the states and provinces are written in all caps within their respective boundaries. The names of the territories are written in title case. The map is oriented with North at the top.

States and Provinces labeled:

- AK (Alaska)
- VT (Vermont)
- NH (New Hampshire)
- MA (Massachusetts)
- RI (Rhode Island)
- CT (Connecticut)
- NY (New York)
- PA (Pennsylvania)
- DE (Delaware)
- MD (Maryland)
- VA (Virginia)
- NC (North Carolina)
- SC (South Carolina)
- GA (Georgia)
- FL (Florida)
- AL (Alabama)
- MS (Mississippi)
- LA (Louisiana)
- TX (Texas)
- NM (New Mexico)
- AZ (Arizona)
- CA (California)
- NV (Nevada)
- UT (Utah)
- CO (Colorado)
- KS (Kansas)
- OK (Oklahoma)
- MO (Missouri)
- IL (Illinois)
- IN (Indiana)
- OH (Ohio)
- MI (Michigan)
- WI (Wisconsin)
- IA (Iowa)
- NE (Nebraska)
- SD (South Dakota)
- ND (North Dakota)
- MT (Montana)
- WY (Wyoming)
- ID (Idaho)
- WA (Washington)
- OR (Oregon)

Provinces and Territories labeled:

- BC (British Columbia)
- AB (Alberta)
- SK (Saskatchewan)
- MB (Manitoba)
- ON (Ontario)
- QC (Quebec)
- NS (Nova Scotia)
- PE (Prince Edward Island)
- NB (New Brunswick)
- NT (Northwest Territories)
- YT (Yukon)
- NU (Nunavut)



Migratory Birds Banding Reports - Data Sheet

1. Goose caught by hand in Maine, 8/16/81.	15. Goose banded in Oklahoma shot by hunter in Saskatchewan, 10/26/81.
2. Neck-collared goose observed by person in New Jersey, 11/28/81.	16. Injured goose caught in Iowa, 11/28/81.
3. Goose found dead by hunter in Maine, 10/16/81.	17. Goose banded 1/2/63 in Maryland and shot by hunter approximately 18 years later in Maryland 11/8/81.
4. Band number of goose read from a distance by observer in Quebec, 7/9/81.	18. Goose banded in Manitoba shot three months later in Missouri, 11/8/81.
5. Hunter reports band from Pennsylvania, 11/12/81.	19. Goose banded in Manitoba 7/19/68, and recaptured near place of banding 7/30/81.
6. Goose caught after being forced down and weakened by bad weather in Pennsylvania, 12/30/77.	20. Goose caught in Illinois after being hit by a vehicle, 7/29/81.
7. Goose shot by hunter in Missouri, 11/11/78.	21. Goose banded in the Northwest Territories, Canada shot in Ohio three months later, 10/21/81.
8. Goose band sent from Ontario with no information about recovery or cause of death, 8/4/81.	22. Goose found dead in Massachusetts, 10/27/81.
9. Hunter reports goose that was taken by his party in Iowa hunt, 10/13/81.	23. Goose killed in Wisconsin by hunter, 10/29/81.
10. Goose banded in Iowa was identified by neck collar and reported from Wisconsin resident, 9/19/81.	24. Goose banded in Ohio found injured in Michigan, 8/4/81.
11. Skeleton of banded goose found and reported from Ohio, 9/8/81.	25. Goose first banded 10/11/67, accidentally killed when recaptured in banding operation in Minnesota, 10/26/81.
12. Goose recaptured almost a year later in the same place where banded in Wisconsin, 10/8/81.	26. Goose banded in Texas shot almost 13 years later in Manitoba, 10/2/81.
13. Goose banded in Colorado killed by a hunter in Wyoming, 10/31/81.	27. Goose banded in Utah identified by neck collar in California, 2/5/81.
14. Goose inadvertently caught by fur trapper in Manitoba, 10/10/81.	28. Goose found dead on highway in Ontario, 9/1/81.

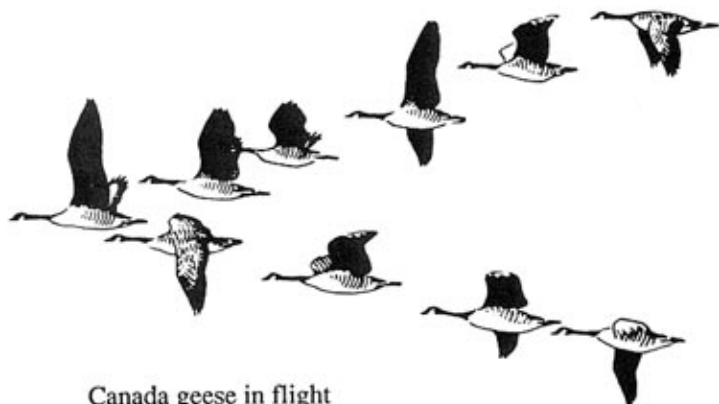
Migratory Birds Banding Reports - Data Sheet

29. Goose collected for scientific specimen in Ohio, 4/27/81.	40. Goose found injured in North Carolina, 6/28/80.
30. Goose found dead in South Dakota, 11/17/81.	41. Goose found dead in New Jersey almost seven years after banding, 5/27/80.
31. Goose banded in Arkansas shot almost 17 years later in South Dakota, 10/20/78.	42. Two geese banded on same day found dead almost a year later near a highway in Virginia, 1/5/72.
32. Goose found entangled in fishing gear in Michigan, 1/5/79.	43. Goose banded in Kentucky 7/1/76, recaptured in Tennessee by another bander, 1/28/80.
33. Goose recaptured at the place of banding one year and one day later in Ontario, 6/22/81.	44. Goose caught by a dog in Minnesota, 5/28/79.
34. Goose captured after it joined a flock of domestic birds in Quebec, 6/23/81.	45. Goose in Missouri found dead after striking a high tension wire, 3/8/79.
35. Goose shot by hunter in Ontario 40 days after it was banded, 8/3/81.	46. Ohio resident with binoculars reported a goose with a band number, 3/20/75.
36. Band reported from North Dakota with no information about bird or circumstances of encounter, 6/15/81.	47. Goose banded in Tennessee later recaptured by a bander in the Northwest Territories of Canada, 1/7/76.
37. Goose found dead in Minnesota, 10/30/81.	48. Goose in British Columbia killed by a moving aircraft, 3/27/80.
38. Goose caught as result of an unknown animal in Minnesota, 11/23/81.	49. Goose found dead due to parasite infestation in Minnesota, 7/22/80.
39. Goose banded in Kansas 2/14/80, shot in Saskatchewan, 11/9/81.	50. Goose found dead due to lead poisoning in South Dakota, 12/17/80.

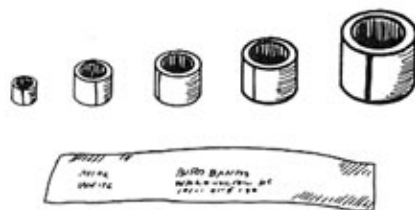
Information

Canada geese migrate in a V-formation at about 50 mph. Their movement is steady and unhurried and closely follows the movement of the seasons.

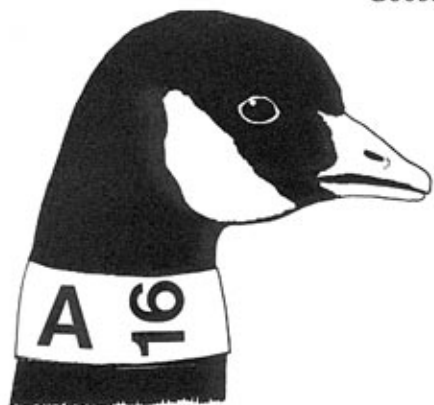
Canada geese are often banded by scientists to obtain information about their migrations. Canada geese make their spring migrations (south to north) from about February to April. Fall migrations (north to south) occur from about September to December.



Canada geese in flight



Goose Mapping: **Information**





WANTED
COLLAR NUMBER
of any
CAACKLING CANADA GOOSE
wearing a yellow neck collar with black lettering

Also called the "cackler", this smallest race of Canada geese was named for its repeated, high-pitched call. Only slightly larger than a mallard, they may weigh up to four pounds. Cackling geese are grayish-brown above, with a dark brown breast which may appear to have a purplish cast. If present, the white neck ring is usually narrow or incomplete. The bill is short, almost stubby.

The population size of cackling Canada geese has declined from 400,000 in the late 1960s to about 30,000 today. Concern about this decline prompted the U.S. Fish and Wildlife Service, the California Department of Fish and Game, and the University of California, Davis, to initiate a study to determine the size of the cackling goose population, as well as its winter distribution in California.

To accomplish this, cackling geese were captured, banded with aluminum leg bands, and marked with yellow plastic neck collars with black lettering. This was done on their breeding grounds in the Yukon Delta NWR, Alaska, as well as their wintering grounds at Tule Lake NWR and Sacramento NWR, California, during 1983 and 1984. The neck collars make it possible to identify individual birds from a distance with a spotting scope, without having to recapture them.

How Can You Help?

If you see a bird with a collar, please note the particular combination of letters and numbers, as well as the date, location, etc. of the sighting. (With the head of the bird up, read the vertical character first, then the horizontal characters,  is A16,  is OL5). Then notify refuge staff at this office, so appropriate records can be maintained. Be aware that some white-fronted geese (also known as "specs") have been marked with yellow collars bearing black lettering, so be sure to distinguish between the two when making your report. Your assistance in this effort will enable wildlife managers and biologists to better understand and protect this species, and hopefully reverse the downward trend in their population numbers.

Thank you!

U.S. Fish and Wildlife Service
Klamath Basin National Wildlife Refuges
Route 1, Box 74
Tulelake, CA 96134
Phone (916) 667-2231

Place the letters to the left where you would find the birds in the refuge.

DESIGN - A - REFUGE / Habitat Match

A	EARED GREBE	Nests in large groups on freshwater lakes. It weaves a floating nest.
B	WESTERN GREBE	Breeds on broad open freshwater lakes edged with reeds. It also builds a woven nest.
C	AMERICAN COOT	Nests in freshwater marshes, wetlands, or near lakes and ponds.
D	GREATER WHITE-FRONTED GOOSE	These birds feed in grassy fields and grainfields. They are seen milling around, or "staging", in the early spring, before migrating north to breed.
E	SNOW GOOSE	
F	CANADA GOOSE	This bird breeds in open or forested areas near water. It needs protection from predators, and favors raised islands in the marsh to nest. Such islands can be built for them, or nesting platforms can be installed in the shallow marsh.
G	MALLARD	This is the most abundant duck in North America. It prefers uplands for nesting, dikes that are close to water, or will nest in marsh growth over water.
H	NORTHERN PINTAIL	Found in marshes and open areas with ponds, lakes. Feeds in grainfields, and selects open areas to nest, where vegetation is low or sparse. Sometimes the nest is located on the bare earth, but is usually found between 40-100 yards from water.
I	NORTHERN SHOVELER	This bird is found in ponds, marshes, or in a farmland-type habitat like hay fields, pastures, or grainfields. Short grass cover is needed for nesting on hayfields. Does not need to nest next to the water.
J	AMERICAN WIGEON	Forages in fields, marshes, and shallow waters. Selects an upland nest site near but not next to water. Locates nest in clumps of brush.
K	RUDDY DUCK	Found on large lakes in areas of bulrushes or cattails. Nests in dense vegetation of freshwater marshes, lakes, or ponds, where it constructs a built-up or floating nest.

Add some public-use options:

A main road is needed to pass through the refuge so an auto-tour can be established. This road should not be located near the nesting geese.

Paths can be placed near the nesting birds, and a boardwalk extended out into the actual habitat of the birds.

Signs are needed to give clear directions.

A kiosk is a small, open exhibit, usually roofed, that contains exhibit panels that tell about the ecosystems and various wildlife in the area. You will want to locate one kiosk in the refuge.

A refuge office should be located on the property so visitors can have access to refuge staff, activities, and facilities.